1a

PROGRAM 1(a)

WALP to move a block of 10 bytes of data stored in the internal data memory from location 30H to the location starting from 40H of the internal data memory.

```
ORG 0000H
MOV R0, #30H
MOV R1, #40H
MOV R2, #10
BACK: MOV A, @ R0
MOV @R1, A
INC RO
INC R1
DJNZ R2, BACK
SJMP $
END
```

A
R0 30H 11
R1 40H 11

Before execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H	11h	i:40H	xx
31H	12h	41H	xx
32H	13h	42H	xx
33H	14h	43H	xx
34H	15h	44H	xx
35H	16h	45H	xx
36H	17h	46H	xx
37H	18h	47H	xx
38H	19h	48H	xx
39H	1ah	49H	Xx
Register	Data		
R0			
R1			
R2			

After execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H	11h	i:40H	11h
31H	12h	41H	12h
32H	13h	42H	13h
33H	14h	43H	14h
34H	15h	44H	15h
35H	16h	45H	16h
36H	17h	46H	17h
37H	18h	47H	18h
38H	19h	48H	19h
39H	1ah	49H	1ah
Register	Data		
R0			
R1			
R2			

1a

PROGRAM 1(b)

WALP to move a block of 10 bytes of data stored in the internal data memory to the external data memory.

Starting address of the internal data memory: 30H.

Starting address of the external data memory: 100H.

```
       ORG 0000H
       MOV R0, #30H
       MOV DPTR, #100H
       MOV R2, #10
BACK:  MOV A, @ R0
       MOVX @DPTR, A
       INC RO
       INC DPTR
       DJNZ R2, BACK
       SJMP $
       END
```

Before execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H	11h	X:100H	xx
31H	12h	101H	xx
32H	13h	102H	xx
33H	14h	103H	xx
34H	15h	104H	xx
35H	16h	105H	xx
36H	17h	106H	xx
37H	18h	107H	xx
38H	19h	108H	xx
39H	1ah	109H	xx
Register	Data		
R0			
DPTR			
R1			

After execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H	11h	X:100H	11h
31H	12h	101H	12h
32H	13h	102H	13h
33H	14h	103H	14h
34H	15h	104H	15h
35H	16h	105H	16h
36H	17h	106H	17h
37H	18h	107H	18h
38H	19h	108H	19h
39H	1ah	109H	1ah
Register	Data		
R0			
DPTR			
R1			

1b

PROGRAM 2(b)

WALP to interchange the 10 bytes of data stored in the internal data memory with the 10 bytes of external data memory location.
Starting address of the internal data memory: 30H.
Starting address of the external data memory: 100H.

```
ORG 0000H
MOV R0, #30H
MOV DPTR, #100H
MOV R2, #10
BACK: MOVX A, @ DPTR
XCH A, @R0
MOVX @DPTR, A
INC RO
INC DPTR
DJNZ R2, BACK
SJMP $
END
```

Before execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H	11h	X:100H	aa
31H	12h	101H	bb
32H	13h	102H	cc
33H	14h	103H	dd
34H	15h	104H	ee
35H	16h	105H	ff
36H	17h	106H	99
37H	18h	107H	88
38H	19h	108H	77
39H	1ah	109H	66
Register	Data		
R0			
DPTR			
R1			

After execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H	aa	X:100H	11h
31H	bb	101H	12h
32H	cc	102H	13h
33H	dd	103H	14h
34H	ee	104H	15h
35H	ff	105H	16h
36H	99	106H	17h
37H	88	107H	18h
38H	77	108H	19h
39H	66	109H	1ah
Register	Data		
R0			
DPTR			
R1			

2a

PROGRAM 3(a)

WALP to add 10 bytes of binary/hex numbers stored in the internal data memory from location 30H. Store the 16 bit sum at location 40 and 41H such that MS byte of sum is stored at 40H of the internal data memory.

```
ORG 0000H
MOV R0, #30H
 MOV R2, #10H
MOV R1, #00H
MOV A, R1
BACK:   ADD A, @ R0
JNC NEXT
INC R1
NEXT:   INC RO
DJNZ R2, BACK
MOV 40H, R1
MOV 41H, A
SJMP $
END
```

Before execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H		i:40H	XX
31H		41H	XX
32H			
33H			
34H			
35H			
36H			
37H			
38H			
39H			

After execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H		i:40H	XX
31H		41H	XX
32H			
33H			
34H			
35H			
36H			
37H			
38H			
39H			

20

PROGRAM 3(b)

WALP to add 10 bytes of BCD numbers stored in the internal data memory from location 30K. St the 16 bit sum at locations 40H and 41H such that MS byte of sum stored at 40H of the internal d memory.

```
         ORG 0000H
          MOV R0, #30H
         MOV R2, #10H
         MOV R1, #00H
         MOV A, R1
BACK:    ADD A,@R0
         DAA
         JNC NEXT
         INC R1
NEXT:    INC R0
         BJNZ R2, BACK
         MOV 40H, R1
         MOV 41H, A
         SJMP $
         END
```

Before execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H		i:40H	XX
31H		41H	XX
32H			
33H			
34H			
35H			
36H			
37H			
38H			
39H			

After execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H		i:40H	XX
31H		41H	XX
32H			
33H			
34H			
35H			
36H			
37H			
38H			
39H			

3B

PROGRAM 4(a)

WALP to add two multi byte numbers (at least 32 bits) stored in the internal data memory from location 30H and location 40H. Store the multi byte sum from location 50B of the internal data memory.

```
        ORG 0000H
        MOV R0, #30H
        MOV R1, #40H
        MOV R2, #50H
        MOV R3, #05H
        CLR C
BACK:   MOV A,@R0
        ADDC A,@R1
        MOV 04H, R1
        MOV R1, 02H
        MOV @R1, A
        MOV 02H, R1
        MOV R1, 04H
        INC R0
        INC R1
        INCR2
NEXT:   DJNZ R3, BACK
        MOV 01H, R2
        MOV A, #00H
        RLC A
        MOV @R1, A
        SJMP $
        END
```

A→ 55H

4 $\boxed{0}$ ← 0101 0101

0 1010 1010

A

Before execution

Source 1		Source 2		Destination	
Memory Address	Data	Memory Address	Data	Memory Address	Data
i:30H		i:40H		i = 50	XX
31H		41H		51H	XX
32H		42H		52H	XX
33H		43H			
34H		44H			
35H		45H			

After execution

Source 1		Source 2		Destination	
Memory Address	Data	Memory Address	Data	Memory Address	Data
i:30H		i:40H		i = 50	
31H		41H		51H	
32H		42H		52H	
33H		43H			
34H		44H			
35H		45H			

PROGRAM 4(b) 8c

WALP to find the square and cube of an 8 bit binary number stored in the internal data memory location 30h

```
X EQU 30H
SQU EQU 31H
CUBE EQU 33H

ORG 0000H
MOV A,X
MOV R0,A
MOV B,A
MUL AB
MOV SQU,B
MOV SQU+1,A
MOV B,R0
MUL AB
MOV R1,A
MOV R2,B
MOV B,R0
MOV A,SQU
MUL AB
ADD A,R2
MOV R2,A
ADDC A,B
~~MOV R3,A~~
MOV CUBE,R3
MOV CUBE+1,R2
MOV CUBE+2,R1
SJMP $
END
```

31 35H

$2 \quad 2^2 \quad 2 \times 2 \quad 2^3$

Before execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H	02	i:31H	XX
		32H	XX
		33H	XX
		34H	XX
		35H	XX

squr

cube

04

08

125 = 625 d = □□ hex

d.

After execution			
Source		Destination	
Memory Address	Data	Memory Address	Data
i:30H		i:31H	XX
		32H	XX
		33H	XX
		34H	XX
		35H	XX

3a

PR0GRAM 12

Let X,Y,Z refers to the contents of the memory location 30h,31h,and 32h respectively write an AL
to perform the following logical operations;

1. If X=00 perform the operation Y OR Z.
2. If X=01 perform the operation Y AND Z.
3. If X=02 perform the operation Y XOR Z.

X → 30h 00 | 01 | 02

Y — 31h } OR | AND | Exo

Z → 32h

```
          ORG 0000H
          MOV R1,30H  x
          MOV A,31H   y
          MOV B,32H   z
          CJNE R1,#00H,BRAND
          ORL A,B
          SJMP LAST
BRAND:    CJNE R1,#01H,BRXOR
          ANL A,B
          SJMP LAST
BRXOR:    CJNE R1,#02H,LAST
          XRL A,B
LAST:     MOV 33H,A
          SJMP $
          END
```

Case ①

X	1:30	00
Y	31	01
Z	32	02
Result	33	03

0000 0001

Case ②

X	1:30	01
Y	31	.02
Z	32	04
Result	33	00h

Case ③

X	1:30h	02
Y	31h	25
Z	32h	38
Result	33h	1Ch

3(b)

PROGRAM 13

WALP to compare the bytes of data present at the memory location 21h and 22h and represent the result of comparison through the bits whose addresses are 00h and 01h.

(1) If (21h)<(22h)then clear the bit at 01h and also set the bit at 00h.

(2) If (21h)>(22h)then set the bit at 01h and also clear the bit at 00h.

(3) If (21h)=(22h)then set the bit at 01h and also set the bit at 00h.

```
        ORG 0000H
        MOV A, 21H
        CLR C
        SUBB A, 22H
        JZ EQUAL
        JNC BIG
        SETB 00H
        CLR 01H
        SJMP LAST
BIG:    CLR 00H
        SETB 01H
        SJMP LAST
EQUAL:  SETB 00H
        SETB 01H
LAST:   SJMP $
        END
```

Bit addressable area 20h to 2F

20h	0	0	0	0	0	0	1	0
addr	07	06	05	04	03	02	01h	00h

Case 1:

Before execution	
Source	
Memory Address	Data
i:20H	XX
21H	15
22H	14

After execution	
Destination	
Memory Address	Data
i:20H	~~01~~ 02
21H	15
22H	14

=> 02h

20h	0	0	0	0	0	0	0	1
							01h	00h

= 01

Case 2:

Before execution	
Source	
Memory Address	Data
i:20H	XX
21H	14
22H	15

After execution	
Destination	
Memory Address	Data
i:20H	~~02~~ 01
21H	14
22H	15

20h	0	0	0	0	0	0	1	1

= 03

Case3:

Before execution	
Source	
Memory Address	Data
i:20H	XX
21H	15
22H	15

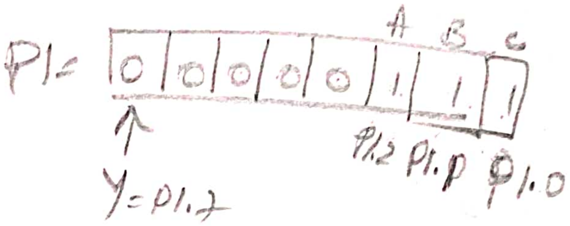
After execution	
Destination	
Memory Address	Data
i:20H	03
21H	15
22H	15

3C

PROGRAM 15

Write an ALP to stimulate the Boolean expression Y=A+BC

```
         ORG 0000H
         MOV P1, #07H
NEXT:    MOV C,P1.0
         ANL C,/P1.1
         ORL C, P1.2
         MOV P1.7, C
         SJMP NEXT
         END
```



A	B	C	BC	Y
0	0	0		
1	1	1		

→ Perpherals

→ I/o ports

→ port 1

→

4a

PROGRAM 6(a)

WALP to count the number of 1's in a byte which is be accepted from the port 0 and display the result in the port1.

```
        ORG 0000H
        MOV P0, #0FFH
BACK:   MOV A, P0
        MOV R0, #00H
        MOV R1, #08H
LOOP:   RLC A
        JNC NEXT
        INC R0
        NEXT: DJNZ R1, LOOP
        MOV P1, R0
        SJMP $
        END
```

Before Execution

Port-0	1	1	0	0	0	0	0	1
Port-1	X	X	X	X	X	X	X	X

After Execution

	128	46	32	16	8	4	2	1
Port-0							✓	✓
Port-1								

4b

PROGRAM 6(b)

WALP to check whether the given byte is a valid bit palindrome, accept the byte from the Port and display AAh if valid else 00H in the Port-1.

```
              ORG 0000H
              MOV P0,#0FFH
        BACK: MOV A,P0
              MOV B,A
              MOV R0,#08
              ACALL REVERSE
              MOV A,30H
              CJNE A,B,NEXT
              MOV P1,#0AAH
              SJMP LAST
        NEXT: MOV P1,#00H
        LAST: SJMP BACK

REVERSE:      RLC A
              MOV R1,A
              MOV A,R2
              RRC A
              MOV R2,A
              MOV A,R1
              DJNZ R0,REVERSE
              MOV 30H,R2
              RET
              END
```

Before Execution

Port-0	**1**	**0**	**0**	**0**	**0**	**0**	**0**	1
Port-1	**X**	**X**	**X**	**X**	**X**	**X**	**X**	X

After Execution

Port-0	**1**	**0**	**0**	**0**	**0**	**0**	**0**	0
Port-1	✓		✓		✓		✓	

5

PROGRAM 9

The output the value AAH and 55H alternatively to the port 0 for every 2 sec.

```
        ORG 0000H
        MOV TMOD,#10H
        MOV A,#55H
    L1: MOV P0,A
        ACALL DELAY
        CPL A
        SJMP L1

        ORG 0050H
DELAY:  MOV R0,#40
    L3: MOV TH1,#3CH
        MOV TL1,#0B0H
        SETB TR1
    L2: JNB TF1,L2
        CLR TR1
        CLR TF1
        DJNZ R0,L3
        RET
        END
```

6

PR0GRAM 11

WALP to count the number of inputs to the counter_0 by configuring the timer as counter in mode_1 and display the count in ports.

```
      ORG 0000H
      MOV TMOD,#05H
      SETB P3.~~5~~ 4
L1:   MOV TL0,#0
      MOV TH0,#0
      SETB TR0
L2:   MOV P2,TL0
      MOV P1,TH0
      JNB TF0,L2
      CLR TR0
      CLR TF0
      SJMP L1
      END
```

8

PROGRAM 10

WALP to transfer the string of data using serial communication by configuring the serial port in mode_1 with a baud rate of 9600,1 step bit and 8 data bits.

```
        ORG 0000H
        MOV TMOD,#20H
        MOV TH1,#-3
        MOV SCON,#50H
        SETB TR1
        MOV DPTR,#DATA1
START:  CLR A
        MOVC A,@A+DPTR
        JZ STOP
        MOV SBUF,A
L1:     JNB TI,L1
        CLR TI
        INC DPTR
        SJMP START
STOP:   NOP

        ORG 100H
DATA1:DB "DEPARTMENT OF ECE",0;
        END
```

PROGRAM 3(a):

9b

//PROGRAM TO GENERATE TRIANGULAR WAVEFORM USING DAC. • C

```
#include<reg52.h>
 void main(void)
 {
 signedint ramp;
 while(1)
 {
  for(ramp=0*00;ramp<=0*FF;ramp++)
  {
   P0=ramp;
  }
  for(ramp=0*FF;ramp>=0*00;ramp--)
  {
  P0=ramp;
  }
  }
  }
```

PROGRAM 3(b):

9a

//PROGRAM TO GENERATE SQUARE WAVEFORM USING DAC • C

9c Ramp
(both +ve & Negative)

50%

```
.#include<reg52.h>
#define DELAY 512
void delay(unsigned int del)
{
while(del--)
}
void main(void)
 {
 while(1)
 {
 P0=0x00;
 delay(DELAY);
 P0=0xFF;
 delay(DELAY);
 }
 }
```

delay(DELAY)

10

PROGRAM 2:

//PROGRAM TO DISPLAY BCD UP COUNTING.

//Connections K 11 with the K20 and connect K 12 with K21

```
#include<reg52.h>
#define DEL 3000
#define LOWER 0x00
#define UPPER 100  0XFF
unsigned char binbcd(unsgined char);
void delay(unsgined int del)
{
while(del--);
}
void main(void)
{
unsgined char val;
while(1)
{
for (val=LOWER;val≤UPPER;val++)
{
P0=binbed(val); ;
delay(DEL);
}
}
}
unsigned char binbcd(unsgined char i)
{
return(((i/10)<<4)|(i%10));
}
```